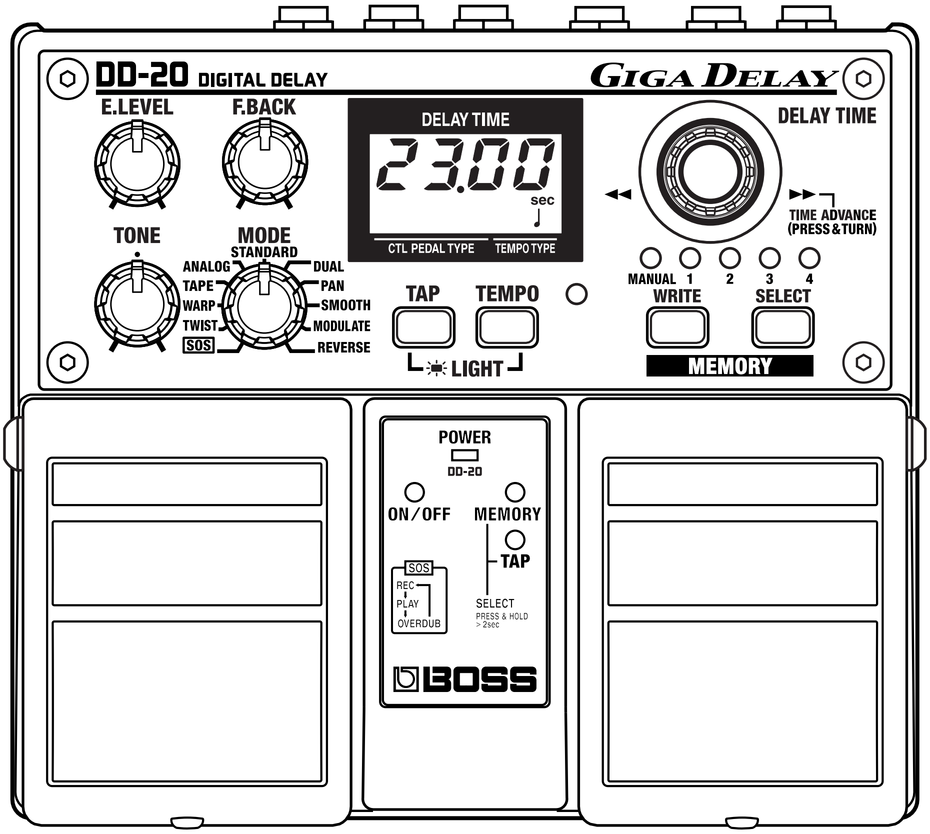
DD-20(T) DIGITAL DELAY

SERVICE NOTES
Issued by RJA

TABLE OF CONTENTS



Roland 17058152E0 Printed in Japan (0800) (NB)

SPECIFICATIONS

DD-20: DIGITAL DELAY

Nominal Input Level

- 20 dBu (GUITAR/BASS)
  +4 dBu (AMPLIFIER SEND/RETURN)

Input Impedance

1 M[ohm]

Nominal Output Level

- 20 dBu (GUITAR/BASS)
  +4 dBu (AMPLIFIER SEND/RETURN)

Output Impedance

1 k[ohm] (OUTPUT A (MONO), B)
33 [ohm] (PHONES)

Recommended Load Impedance

10 k[ohm]

Residual Noise Level

- 93 dBu or less (IHF-A typ.)

* *E. LEVEL/F. BACK/TONE knobs are set to the center position*

Display

Custom LCD (with backlit)

Controls

ON/OFF Pedal
MEMORY/TAP Pedal
DELAY TIME Knob
E.LEVEL Knob
F. BACK Knob
TONE Knob
MODE Knob
TAP Button
TEMPO Button
MEMORY WRITE Button
MEMORY SELECT Button

Indicators

POWER Indicator
(serves also as battery check indicator)
ON/OFF Indicator
MEMORY Indicator
TAP Indicator
MANUAL Indicator
MEMORY Number Indicator 1-4
TEMPO Indicator

Connectors

INPUT A (MONO) Jack (1/4 inch phone type)
INPUT B Jack (1/4 inch phone type)
PHONES Jack (stereo 1/4 inch phone type)
CTL PEDAL Jack (1/4 inch phone type)
OUTPUT A (MONO) Jack (1/4 inch phone type)
OUTPUT B Jack (1/4 inch phone type)
AC Adaptor Jack

Power Supply

Dry battery (R6/LR6 (AA) type) x 6: DC 9V
AC Adaptor (DC 9V)

Current Draw

200 mA (9 V max.)

* *Expected battery life under continuous use:*

Carbon:	2 hours
Alkaline:	7 hours

These figures will vary depending on the actual conditions of use.

Dimensions

173 (W) x 158 (D) x 57 (H) mm
6-13/16 (W) x 6-1/4 (D) x 2-1/4 (H) inches

Weight

1.2 kg / 2 lbs 11 oz (including batteries)

Accessories

Owner's Manual JAPANESE:(#G6017365)
ENGLISH:(#G6017366)
Dry battery (LR6 (AA) type) x 6(#********)

* *We recommend that alkaline batteries be used when replacing the batteries.*

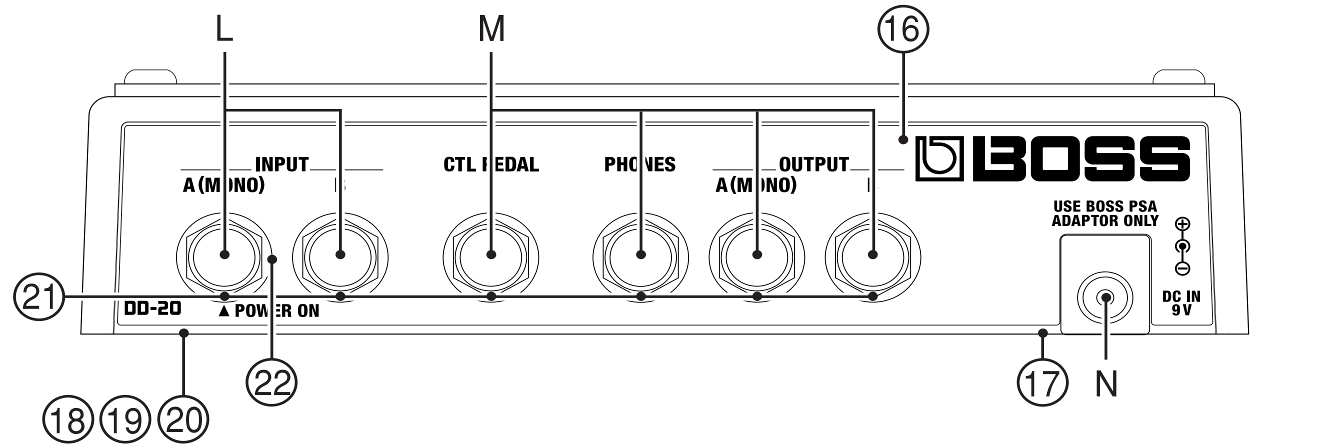
Options

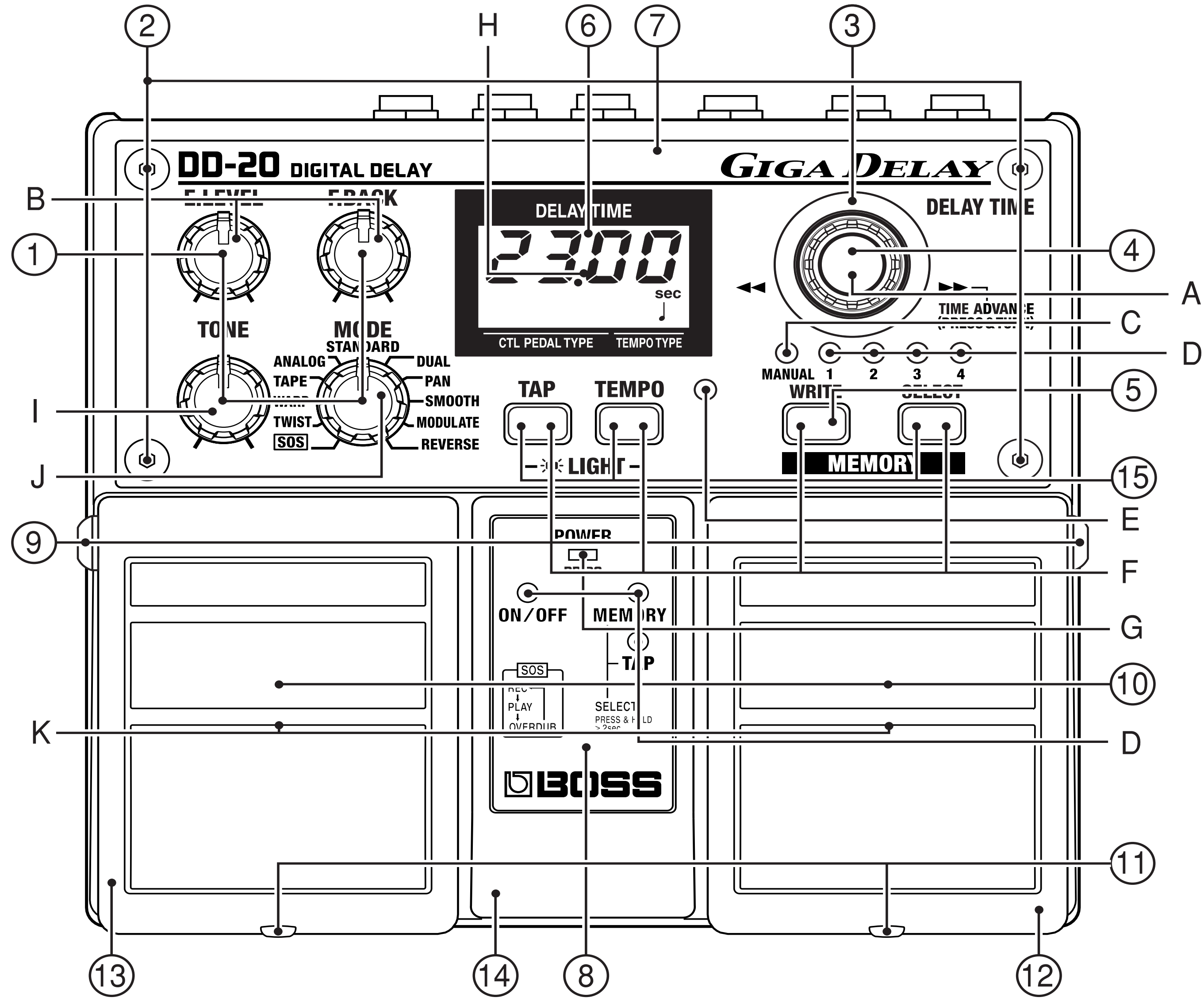
AC Adaptor (PSA-series)

* *0 dBu = 0.775 Vrms*

* *In the interest of product improvement, the specifications and/or appearance of this unit are subject to change without prior notice.*

LOCATION OF CONTROLS

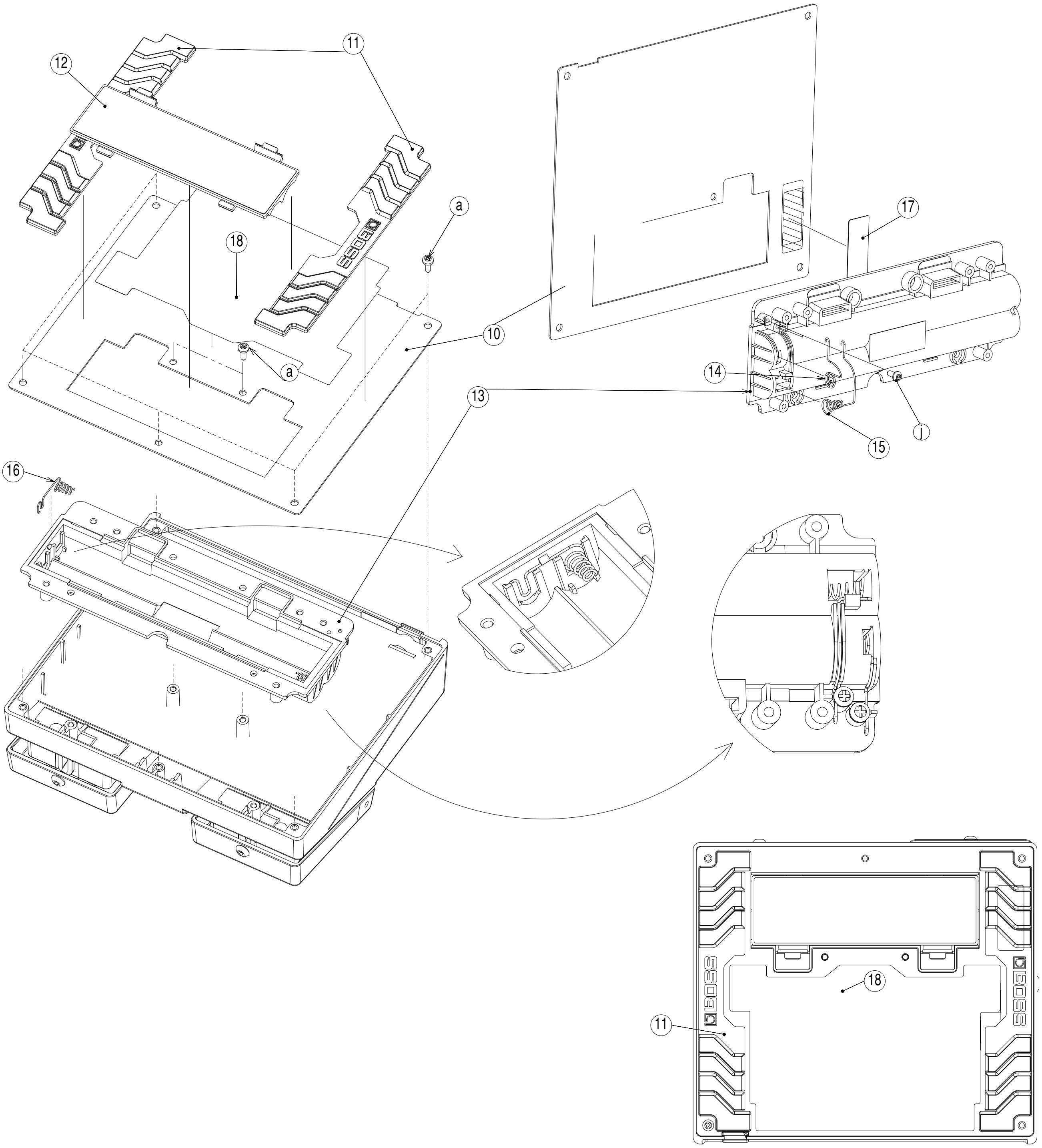


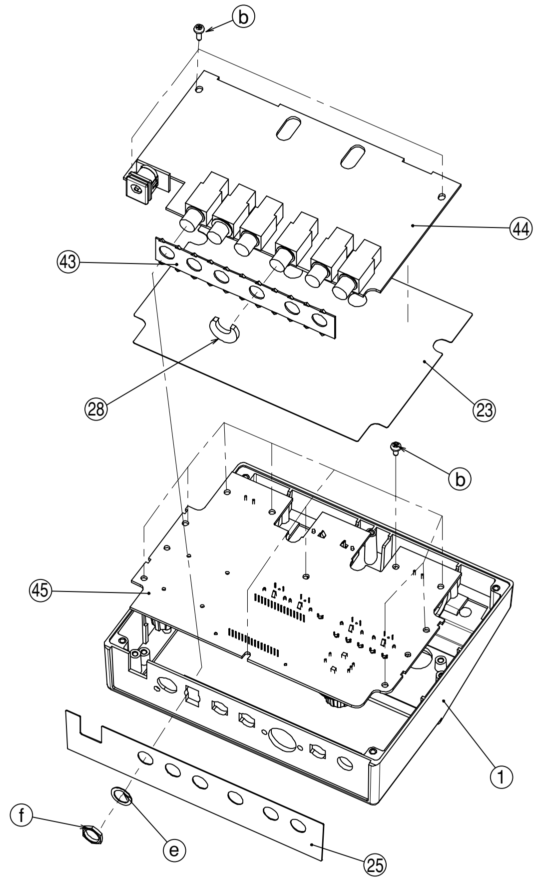


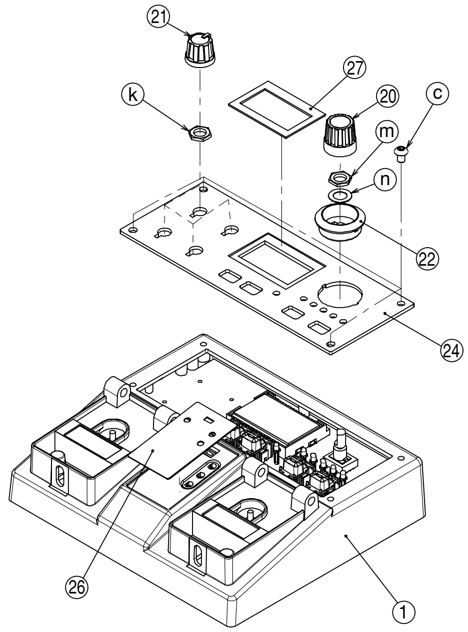
LOCATION OF CONTROLS PARTS LIST

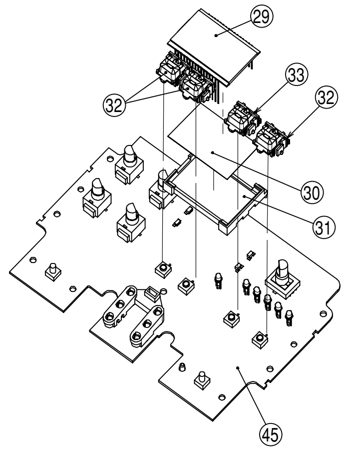
No.	Part Code	Part Name	Description
1	G2477122	R-KNOB	
2	H5029855	SCREW M4X8	HEXAGON BUTTON HEAD NI
3	G2567155	ENC ESC	
4	G2477130	ENC KNOB	
5	G2497001	KEYTOP S(RED)	
6	G2567156	LCD PANEL	
7	G2217180	PANEL	
8	G2217181	LED PANEL	
9	H5029851	PEDAL SHAFT	
10	G2357116	PEDAL PLATE	62X53
11	H5029852	SCREW 4M3 FEBZC	HEXAGON SOCKET BUTTON HEAD
12	75E041R000	PEDAL R	
13	75E041L000	PEDAL L	
14	75E041C000	CASE	
15	G247751301	VGA KEYTOP S WITHOUT LENS	
16	G2217182	REAR PANEL	
17	G2537731	QUICK MANUAL LABEL	
18	G2017621	BATTERY COVER	
19	75D422E000	BOTTOM COVER	
20	G2357118	BOTTOM FOOT	
21	40123545	JACK NUT 9X11X2	HLJ0999-01-240 NI
22	40016467	JACK WASHER M9.2X14X0.5	FENI
A	03231912	ROTARY ENCODER W/SW	R-ENCODER EVQB1SZ1720B
B	F3279802	POTENTIOMETERNO CLICK 50KB	RD901-40-125F-B54-00D
C	F5029106	LED (GREEN)	L-32GDSL
D	1502928100	LED (RED)	L-34HDSL
E	F5029133	LED (BLUE)	L-934MBD
F	F3129306	SWITCH	SKQKAB
G	F5029126	POWER LED	L-113GDT
H	F5029414	LCD	DC-320 A
I	F3279819	ROTARY POT. W/CENTER CLICK	RD901-40-125F-B54-0CD 50KB
J	F3279803	POTENTIOMETER 11 CLICKS 50KB	RD901-40-125F-B54-11D
K	13129778	TACT SWITCH	SKQKAH
L	F3449707	PHONE JK(STREO)	HTJ-064-12DS
M	13449150MF	PHONE JACK (STEREO)	HTJ-064-12D
N	F344941501	ADAPTOR JK	KM02009BB

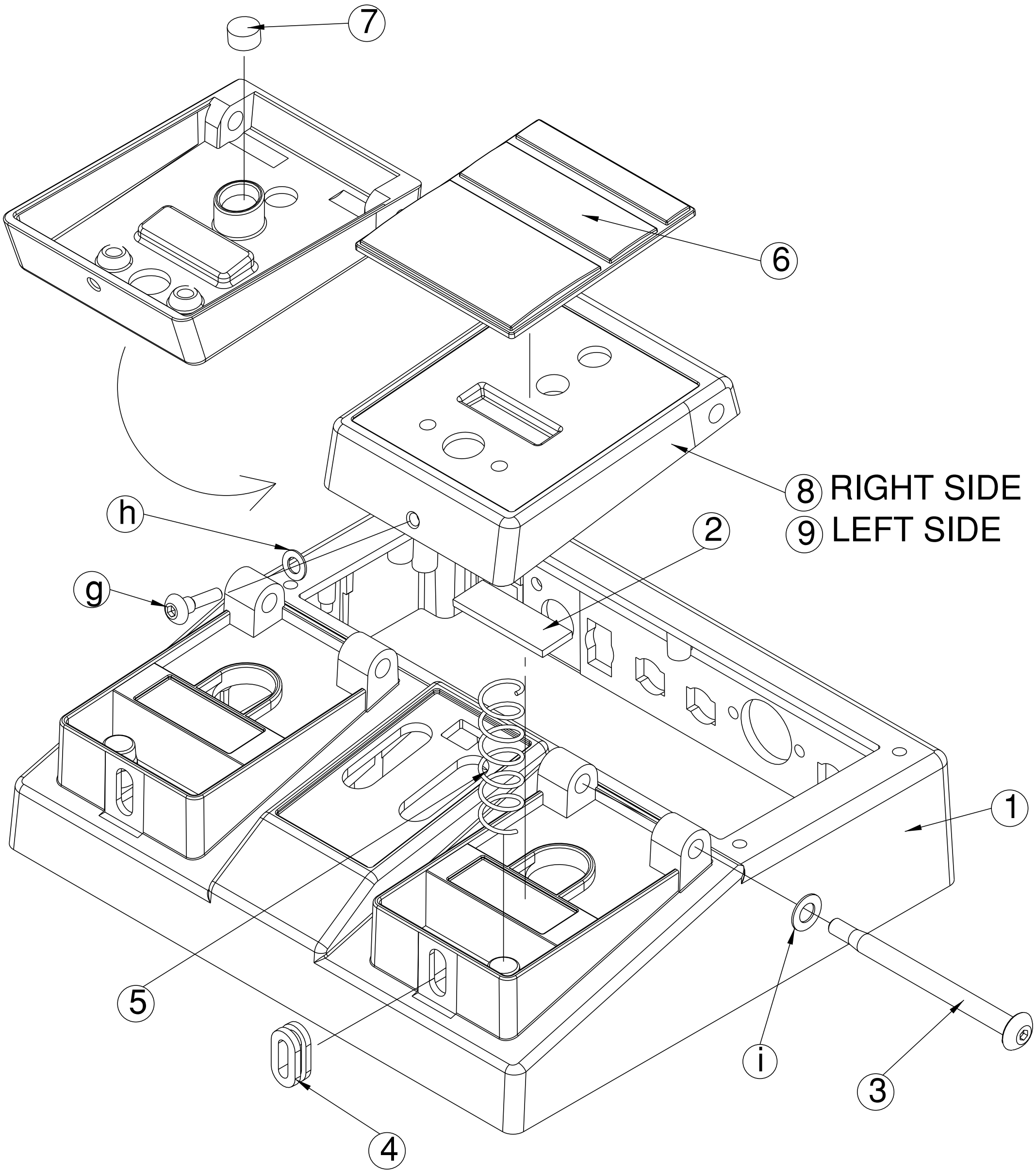
EXPLODED VIEW




b
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25


21
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29
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7
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8 RIGHT SIDE
9 LEFT SIDE
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g
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i
3
4

EXPLODED VIEW PARTS LIST

[PARTS]

No.	Part Code	Part Name	Description	Q'ty
1	75E041C000	CASE		1
2	G2357111	CUSHION R		2
3	H5029851	PEDAL SHAFT		2
4	2215770201	PEDAL GUIDE BUSH	215-702	2
5	2217710900	COIL SPRING	217-109	2
6	G2357116	PEDAL PLATE	62X53	2
7	G2357115	PEDAL FOOT	M8	2
8	75E041R000	PEDAL R		1
9	75E041L000	PEDAL L		1
10	G2017148	BOTTOM COVER		1
11	G2357118	BOTTOM FOOT		2
12	G2017621	BATTERY COVER		1
13	G2017620	BATTERY CASE		1
14	G2177308	BATTERY TERMINAL(+)		1
15	G2177309	BATTERY TERMINAL(-)		1
16	G2177307	BATTERY TERMINAL(+-)		1
17	G2257130	BATTERY INSULATING SHEET		1
18	G2537731	QUICK MANUAL LABEL		1
20	G2477130	ENC KNOB		1
21	G2477122	R-KNOB		4
22	G2567155	ENC ESC		1
23	G2257129	INSULATING SHEET CENTER		1
24	G2217180	PANEL		1
25	G2217182	REAR PANEL		1
26	G2217181	LED PANEL		1
27	G2567156	LCD PANEL		1
28	G2197127	JACK SPACER		1
29	F5029414	LCD	DC-320 A	1
30	G224780201	DIFFUSION SHEET		1
31	F5029410	LCD BACKLIT	43.3X23.6	1
32	G247751301	VGA KEYTOP S WITHOUT LENS		3
33	G2497001	KEYTOP S(RED)		1
43	G2147807	JACK HOLDER		1
44	75E041M000	JACK BOARD ASSY		1
45	75E041P000	PANEL BOARD ASSY		1

[SCREWS]

No.	Part Code	Part Name	Description	Q'ty
a	H5029115	SCREW 3X8	PAN TATITE FEBZC	7
b	H5019110	SCREW M3X6	PAN TAPTITE FEZC	13
c	H5029855	SCREW M4X8	HEXAGON BUTTON HEAD NI	4
e	40016467	JACK WASHER M9.2X14X0.5	FENI	6
f	40123545	JACK NUT 9X11X2	HLJ0999-01-240 NI	6
g	H5029852	SCREW 4M3 FEBZC	HEXAGON SOCKET BUTTON HEAD	2
h	H5039413	NYLON WASHER M4.1X7.5X0.5	BLACK	2
I	H5039413	NYLON WASHER M4.1X7.5X0.5	BLACK	2
j	H5019430	SCREW M2.6X5	BINDING HEAD TAPTITE P FEZC	2
k	H5039521	VR ACCESSORY NUT M7		4
m	H5039521	VR ACCESSORY NUT M7		1
n	H5039127	VR WASHER M7		1

PARTS LIST

SAFETY PRECAUTIONS:
The parts marked ⚠ have safety-related characteristics. Use only listed parts for replacement.

CONSIDERATION ON PARTS ORDRING
When ordering any parts listed in the parts list, please specify the following items in the order sheet.

	QTY	PART NUMBER	DESCRIPTION	MODEL NUMBER
Ex.	10	22575241	Sharp Key	C-20/50
	15	2247017300	Knob (orange)	DAC-15D

Failure to completely fill the above items with correct number and description will result in delayed or even undelivered replacement.

NOTE: The parts marked # are new. (initial parts)

CASING

					Q'ty
	G2357116	PEDAL PLATE	62X53		2
	G2017620	BATTERY CASE			1
	G2017621	BATTERY COVER			1
	75D422E000	BOTTOM COVER			1
	G2357118	BOTTOM FOOT			2
#	75E041C000	CASE			1
#	G2217181	LED PANEL			1
#	G2217180	PANEL			1
#	75E041L000	PEDAL L			1
#	75E041R000	PEDAL R			1
	H5029851	PEDAL SHAFT			2
#	G2217182	REAR PANEL			1

KNOB,BUTTON

#	G2567155	ENC ESC			1
#	G2477130	ENC KNOB			1
#	G2497001	KEYTOP S(RED)			1
#	G2567156	LCD PANEL			1
	G2477122	R-KNOB			4
	G247751301	VGA KEYTOP S WITHOUT LENS			3

SWITCH

	13129778	SKQKAH	TACT SWITCH	SW6,SW1 on panel	2
	F3129306	SKQKAB	SWITCH	SW2,SW3,SW4,SW5 on panel	4

JACK,EXT TERMINAL

#	F3449707	HTJ-064-12DS	PHONE JK(STREO)	JK1,JK2 on Jack	2
	13449150MF	HTJ-064-12D	PHONE JACK (STEREO)	JK3,JK4,JK5,JK8 on Jack	4
#	F344941501	KM02009BB	ADAPTOR JK	JK6 on Jack	1

DISPLAY UNIT

	F5029410	43.3X23.6	LCD BACKLIT		1
#	F5029414	DC-320 A	LCD	LCD1 on panel	1

PWB ASSY

#	75E041M000	JACK BOARD ASSY			1
#	75E041P000	PANEL BOARD ASSY			1

IC

#	F5199108	NJM2374AM-TE1	IC (SWITING REGULATOR)	IC11 on Jack	1
#	F5179307	M12L6416-7T	IC (SDRAM)	IC16 on Jack	1
#	F5209130	M51957BFP	IC (RESET)	IC7 on Jack	1
#	15289216	M5218AFP-600E	IC (OP AMP)	IC1,IC4,IC5 on Jack	3
#	F5279308	BU2090F	IC (LED DRIVER)	IC1on panel	1
#	03232367	DRIVER BU9728AKV-E2	IC (LCD DRIVER)	IC2 on panel	1
#	03236601	UPD703105AGJ-019-UEN DD-20 1.	IC (CPU)	IC8 on Jack	1
	F5289102	NJM2100M 8P SOP	IC (OP.AMP)	IC3 on Jack	1
	F5179604	CAT24WC02J	IC (EEPROM)	IC10 on Jack	1
	02565501	TC220CCA0AF-B01(MR3)	IC (DSP)	IC9 on Jack	1
	F5179125	S-8520E33MC-BJS-T2	IC (DC-DC)	IC12 on Jack	1
	01679990	AK4524VF-E2	IC (AD/DA)	IC6 on Jack	1
#	F5279305	TC4066BFT	IC	IC18 on Jack	1
#	F5179171	TC7S14FU-TE85L	IC	IC15 on Jack	1
	15189250	M5218AL	IC (OP AMP)	IC13 on Jack	1

TRANSISTOR

	15319107	2SC4116-GR(TE85R)	TRANSISTOR	Q9,Q10,Q11,Q12,Q13,Q14,Q15 on Jack	7
	15329521	RN1307(TE85R)	TRANSISTOR	Q7 on Jack	1
#	F5329536	CPH6302	POWER MOS FET	Q17 on Jack	1
	15329103	2SK880GR-TE85R	FET TRANSISTOR	Q1,Q5 on Jack	2
	F5329530	2SK879Y	FET	Q2,Q3,Q4,Q6,Q8 on Jack	5
#	F5119901	RN1207-TE85R	DIGITAL TRANSISTOR	Q1 on panel	1

DIODE

#	15019523CH	RD 5.1EB3	ZENNER DIODE	D1 on panel	1
	15019126	1SS133 T-77	SWITCHING DIODE	D2,D3,D4,D5,D6,D7 on panel	6
	F5029126	L-113GDT	POWER LED	LED1 on panel	1
	1502928100	L-34HDSL	LED (RED)	LED10,LED11,LED12,LED14,LED15,LED16,LED 17 on panel	7
	F5029106	L-32GDSL	LED (GREEN)	LED9 on panel	1
	F5029133	L-934MBD	LED	LED6 on panel	1
	15339120	1SS302	DIODE	DA1,DA2,DA3,DA4,DA5,DA6,DA7 on Jack	7
	F5339138	1SS355	DIODE	D1,D2,D3,D4,D5,D6 on Jack	6
	F5339137	SS14 VF=0.45V	DIODE	D7,D9,D10 on Jack	3
#	F5029129	SML-110MT	CHIP LED(GREEN)	LED2,LED3,LED4,LED5 on panel	4

RESISTOR

	F5419707	CRN34101J	RESISTOR ARRAY	RA9,RA12,RA15,RA16 on Jack	4
#	F5419764	CRN34470J	RESISTOR ARRAY	RA3,RA5,RA6,RA7,RA8,RA10,RA11,RA13,RA17 on Jack	9
#	F5419714	EXBA10P103J	RESISTOR ARRAY	RA2,RA4 on Jack	2
	F5429366	15K OHM F RANK (1%)	RESISTOR (CHIP)	R86 on Jack	1
	F5419716	CRN34103J	RESISTOR (CHIP)	RA14,RA18,RA20 on Jack	3
	F5419726	CRN34473J	RESISTOR ARRAY	RA1 on Jack	1
	F2569127	MINISMDC075	POLY SWITCH	R76 on Jack	1
	00566867	RPC05T 100 J	MTL.FILM RESISTOR	R126 on Jack	1
	00567023	RPC05T 101 J	MTL.FILM RESISTOR	R73,R145,R146 on Jack	3
	00567156	RPC05T 102 J	MTL.FILM RESISTOR	R7,R31,R51,R70,R74,R78,R90,R120,R129 on Jack R12,R13,R14,R15 on panel	9
	00567289	RPC05T 103 J	MTL.FILM RESISTOR	R3,R8,R13,R15,R18,R23,R26,R29,R32,R34,R37, R42,R71,R72,R83,R101,R102,R119,R130,R157, R160,R163,R166 on Jack	23
	00567412	RPC05T 104 J	MTL.FILM RESISTOR	R10,R11,R22,R36,R50,R55,R56,R57,R58,R59,R108, R115,R117,R127,R154,R156 on Jack	16
	00567556	RPC05T 105 J	MTL.FILM RESISTOR	R4,R9,R16,R17,R25,R27,R33,R45,R46,R60,R61, R62,R63,R64,R88 on Jack	15
	00567290	RPC05T 123 J	MTL.FILM RESISTOR	R161,R162 on Jack	2
	00567334	RPC05T 273 J	MTL.FILM RESISTOR	R82 on Jack	1
	00567367	RPC05T 393 J	MTL.FILM RESISTOR	R12,R14,R30,R43 on Jack	4
	00566967	RPC05T 470 J	MTL.FILM RESISTOR	R75,R92,R93,R95,R137,R138,R139,R140,R141, R142 on Jack	10
	00567245	RPC05T 472 J	MTL.FILM RESISTOR	R48,R49,R79,R80,R85,R153,R155 on Jack	7
	00567378	RPC05T 473 J	MTL.FILM RESISTOR	R1,R2,R5,R6,R19,R20,R21,R28,R35,R40,R41,R44, R47,R65,R66,R67,R68,R69,R103,R104,R105,R106, R110,R111,R112,R113,R118,R124,R136,R159 on Jack	30
	00567278	RPC05T 822 J	MTL.FILM RESISTOR	R24,R38,R39,R52 on Jack	4
#	F5399950	R-33_1/2W	CHIP RESISTOR(1/2W)	R109,R116 on Jack	2
	F5399908	1 J (3225TYPE)	CHIP RESISTOR	R77 on Jack	1
	F5429392	287K F (1608TYPE)	CHIP RESISTOR	R81 on Jack	1
	01788301	RD16ST26A 102 J	CARBON RESISTOR	R5,R6,R11,R17,R18,R19,R20 on panel	7
#	01897556	RD16ST26A 221 J	CARBON RESISTOR	R7 on panel	1
	01788312	RD16ST26A 222 J	CARBON RESISTOR	R3 on panel	1
	01897578	RD16ST26A 331 J	CARBON RESISTOR	R4 on panel	1
#	F5399296	R-603/4R7	MTL.FILM RESISTOR	R53 on Jack	1
	00567112	RPC05T 471 J	CHIP RESISTOR	R1,R2 on panel	2
	00567501	RPC05T 474 J	CHIP RESISTOR	R16 on panel	1

POTENTIOMETER

	F3279819	RD901-40-125F-B54-0CD 50KB	ROTARY POT. W/CENTER CLICK	VR2 on panel	1
	F3279802	RD901-40-125F-B54-00D	POTENTIOMETERNO CLICK 50KB	VR3,VR4 on panel	2
	F3279803	RD901-40-125F-B54-11D	POTENTIOMETER 11 CLICKS 50KB	VR1 on panel	1

CAPACITOR

	13639581M0	10/35V	ELECTROLYTIC CAPACITOR (7MM)	C4,C6,C8,C12,C13,C18,C20,C28, C34,C58,C59,C82	14
	F5239252	47/50V	ELECTROLYTIC CAPACITOR (7MM)	C79,C80 on Jack	2
	F5349400	B0805F105ZNT	CHIP CAPACITOR (2012TYPE)	C108,C33 on Jack	2
#	F5359332	C-603/105P	CHIP CAPACITOR	C170 on Jack	1
#	F5359354	C-603/334P	CHIP CAPACITOR	C40,C41,C42,C43,C44 on Jack	5

CAPACITOR

#	15359701	CERAMIC CAPACITOR ECUV1H104ZF	CHIP CAPACITOR	C23,C27,C46,C47,C48,C49,C50, C52,C54,C55,C56,C57,C60,C74, C76,C78,C84,C96,C97,C103,C134, C136,C140,C141,C142,C143,C144, C147,C149,C154,C155,C156,C157, C158,C159,C160,C161,C162,C163, C180,C181 on Jack, C1 on panel	42
#	00239601	0.1U/50V	POLYEST CAPACITOR	C2,C16 on Jack	2
	13629624S0	6SC10M+T (OS) 6.3V10	CHEMICAL CAPACITOR	C5 on Jack	1
	02891767	RC2-16V100M-T2	CHEMICAL CAPACITOR	C26,C31,C35,C75,C135,C145 on Jack, C3 on panel	7
	02891745	RC2-16V101M-T2	CHEMICAL CAPACITOR	C45,C61,C83,C95,C98,C100,C106, C112,C139,C164 on Jack	10
	02897889	RC2-16V470M-T2	CHEMICAL CAPACITOR	C148 on Jack	1
	02782723	RC2-50V010M-T2	CHEMICAL CAPACITOR	C137 on Jack	1
	02129534	ECJ1VB1H102K	CERAMIC CAPACITOR	C21,C22,C114,C119,C131 on Jack, C4 on panel	6
	01674612	ECJ1VB1H103K	CERAMIC CAPACITOR	C150,C152,C165,C166,C167,C168 on Jack	6
	F5359816	C-603/683P	CERAMIC CAPACITOR	C77 on Jack	1
	01674334	ECUV1H101JCV	CERAMIC CAPACITOR	C3,C17 on Jack	2
	01674356	ECUV1H151JCV	CERAMIC CAPACITOR	C86,C104,C110 on Jack	3
	01674201	ECUV1H180JCV	CERAMIC CAPACITOR	C92 on Jack	1
	01674212	ECUV1H220JCV	CERAMIC CAPACITOR	C91 on Jack	1
	01674234	ECUV1H330JCV	CERAMIC CAPACITOR	C1,C10,C15,C30 on Jack	4
	01674423	ECUV1H471JCV	CERAMIC CAPACITOR	C11,C32 on Jack	2
	15359612	ECUV1H100DN	CERAMIC CAPACITOR	C51,C101,C102,C107,C113,C120, C130,C151,C153 on Jack	9
	13519452	DD-306-959F104Z25	CERAMIC CAPACITOR	C2 on panel	1

INDUCTOR,COIL,FILTER

	F2449214	SLF12555T-681MR43 680UH	SMD COIL	L2 on Jack	1
#	F5409134	BLM18BD152SD1	FERRITE-BEAD	L16,L17 on Jack	2
#	F5409102	N1608Z601T02	FERRITE-BEAD	L1,L4,L8,L9,L12,L13,L18,L21,L24,L25 on Jack	10
#	F5409133	QT1608RL600HC1A	FERRITE-BEAD	L19,L20,L22 on Jack	3
	F5409114	NFM4516P13C204F	EMI FILTER	C62 on Jack	1
	F2449209	SLF7032T-151MR29-2(150UH)	COIL	L3,L5 on Jack	2

CRYSTAL,RESONATOR

	F5299307	HC-49SM 11.2896MHZ	CRYSTAL	X2 on Jack	1
	F5299114	HC-49SM 5MHZ	CRYSTAL	X3 on Jack	1

ENCODER

#	03231912	R-ENCODER EVQB1SZ1720B	ROTARY ENCODER W/SW	ENC_on panel	1

CONNECTOR

	F3439160	53015-0210 2P P=2MM	CONNECTOR	CN3 on Jack	1
	F3439161	A2001WR2-16P P=2MM	CONNECTOR	CN2,CN1 on Jack	2
#	F3439197	A2541WV2-2AX12P	SOCET	CN3,CN4 on panel	2

WIRING,CABLE

	G3477154	FLAT CABLE	3P P=2MM	CN4,CN5 on Jack	2
	G3489223	WIRING 16P	16P	CN1,CN2 on panel	2
	G3487163	WIRING BATTERY	L=80MM 2P		1

SCREWS

	H5029115	SCREW 3X8	PAN TATITE FEBZC	7
	H5019110	SCREW M3X6	PAN TAPTITE FEZC	13
	40123545	JACK NUT 9X11X2	HLJ0999-01-240 NI	6
	H5029852	SCREW 4M3 FEBZC	HEXAGON SOCKET BUTTON HEAD	2
	H5029855	SCREW M4X8	HEXAGON BUTTON HEAD NI	4
	40016467	JACK WASHER M9.2X14X0.5	FENI	6
	H5039413	NYLON WASHER M4.1X7.5X0.5	BLACK	4
	H5019430	SCREW M2.6X5	BINDING HEAD TAPTITE P FEZC	2
	G2197127	JACK SPACER		1
#	G2147807	JACK HOLDER		1
	H5039414	NYLON WASHER M7.5X4.1X0.5	BLACK	2
	H5039521	VR ACCESSORY NUT M7		5
	H5039127	VR WASHER M7		1

PACKING

	H2679505	POLYETHYLENE BAG	220X340X0.03	1
#	G2607110	PACKIN CASE UPPER		1
	G2607212	PACKING CASE LOWER		1

PACKING

	G2237613	REAR PAD			1
	G2237614	SIDE PAD			1

MISCELLANEOUS

	G2357115	PEDAL FOOT	M8		2
	H2369450	LED SPACER	H=8MM		5
	2217710900	COIL SPRING	217-109		2
	2215770201	PEDAL GUIDE BUSH	215-702		2
	G2257130	BATTERY INSULATING SHEET			1
	G2177308	BATTERY TERMINAL(+)			1
	G2177307	BATTERY TERMINAL(+-)			1
	G2177309	BATTERY TERMINAL(-)			1
	G2357111	CUSHION R			2
	G2257129	INSULATING SHEET CENTER			1
	G2197126	LED GUIDE			1
#	H2369429	LED SPACER 3-9		LED6	1
#	G2537731	QUICK MANUAL LABEL			1
#	G224780201	DIFFUSION SHEET			1

ACCESSORIES (Standard)

	G601730301	IMPORTANT NOTES	JAPANESE/ENGLISH		1
#	G6017365	OWNER'S MANUAL	JAPANESE		1
#	G6017366	OWNER'S MANUAL	ENGLISH		1
#	********	ALKALINE BATTERY GP15A	a pair of batteries		3

CHECKING THE VERSION NUMBER

1. Turn all volume controls completely to the left.
2. While holding down the left pedal's ON/OFF and the right pedal's TAP/MEMORY, connect the AC ADAPTOR to the ADAPTOR jack (which turns on the power).
3. Only the POWER LED lights up.
4. Release the left and right pedals.
5. Within four seconds, press the left pedal and the right pedal, in that order.
6. The unit switches to Test mode, and all of the LEDs light up or flash.
7. The version number will be shown in the LCD.

NOTE

In "2," if no AC ADAPTOR is connected to the ADAPTOR jack, the power can be turned on by inserting batteries in the unit and connecting the INPUT A(MONO) plug.

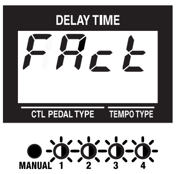
RESTORING THE FACTORY SETTINGS

NOTE

Carrying out the following procedure completely clears the content currently stored in the memories (1-4).

1. Switch off the power.
2. While holding down the WRITE button, switch on the power.

The MEMORY Number indicators (1-4) flash.



3. Press the WRITE button.

After the MEMORY Number indicators (1-4) begin flashing rapidly, the setting is stored in memory and the unit returns to its ordinary state.

NOTE

To cancel the setting change and the unit returns to its ordinary state, then before you press the WRITE button, operate the MEMORY/TAP or ON/OFF pedal.

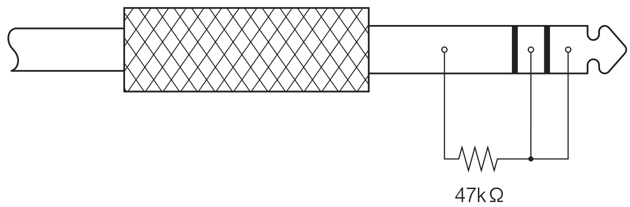
TEST MODE

Test Items

1. DSP, EEPROM Check (also used to indicate the version)
2. LCD, Switch, LED Checks, Foot Switch Operational Check
3. VR, Encoder Check
4. DAC, PHONES Check (includes OUTPUT A (MONO), B jack detection check)
5. ANALOG BYPASS Check (includes INPUT B jack detection check)
6. MUTE Check
7. DSP THRU Check
8. AD MUTE Check
9. ANALOG BYPASS Check
10. DSP MUTE Check
11. INPUT Level Switch Check
12. SDRAM Check
13. MODE Volume Operational Check
14. Factory Reset
15. Residual Noise, Shock Noise Check
16. Battery Operation Check

Tools Required

- Oscillator
- Parallel box (BOSS J-5)
- Oscilloscope
- Noise meter
- 47 k[ohm] short plug (#17048536) Please refer to the following figure.
- Stereo/monaural converter cable (PCS-31 or similar)
- FS-5U (BOSS) (2)
- AC ADAPTOR (PSA-100)



Entering Test Mode

1. Connect standard audio (mono) cables to all of the INPUT A(MONO) and B jacks and OUTPUT A(MONO) and B jacks, and connect a stereo/monaural converter cable (PCS-31 or similar) to the CTL jack. Connect the other ends to the two FS-5U foot switches, and set the “POLARITY” switch on the FS-5Us towards the FS-5U jacks.
2. Turn all volume controls completely to the left (to minimum).
3. While holding down the left pedal’s ON/OFF and the right pedal’s TAP/MEMORY, connect the +9V DC plug to the ADAPTOR jack (which turns on the power).
4. Only the POWER LED lights up.
5. Release the left and right pedals.
6. Within four seconds, press the left pedal and the right pedal, in that order.
7. The unit switches to Test mode, and all of the LEDs light up or flash.

NOTE

In “2”, if no +9V DC plug is connected to the ADAPTOR jack, the power can be turned on by inserting batteries in the unit and connecting the INPUT A(MONO) plug.

NOTE

The “DSP, EEPROM Check” commences automatically with entry into Test mode.

The status of the LEDs differs when entering into Test mode. For more detailed information, refer to the item “DSP, EEPROM Check.”

NOTE

The unit cannot enter Test mode unless all of the volume controls are turned to minimum (MODE: “SOS”).

NOTE

To conduct only a specific test, after entering Test mode, switch the MODE volume control to the setting corresponding to the desired test.

NOTE

Although carrying out the procedure in “1” switches the unit to Test mode, “2. LCD, Switch, LED Checks, Foot Switch Operational Check” cannot be run alone.

Detailed Test Items

1. DSP, EEPROM Check (also used to indicate the version)
   - Enter Test mode.
   - After the unit is switched to Test mode, the version number automatically appears in the LCD as a four-digit number, while simultaneously the DSP and EEPROM check is performed.
   - Confirm that all of the LEDs are lit, indicating that no problem was detected.

If there is a problem, the cause is indicated by the LEDs as described below.

ON/OFF flashing:EEPROM error

MEMORY flashing:DSP PRAM error

TAP flashing: IRAM error

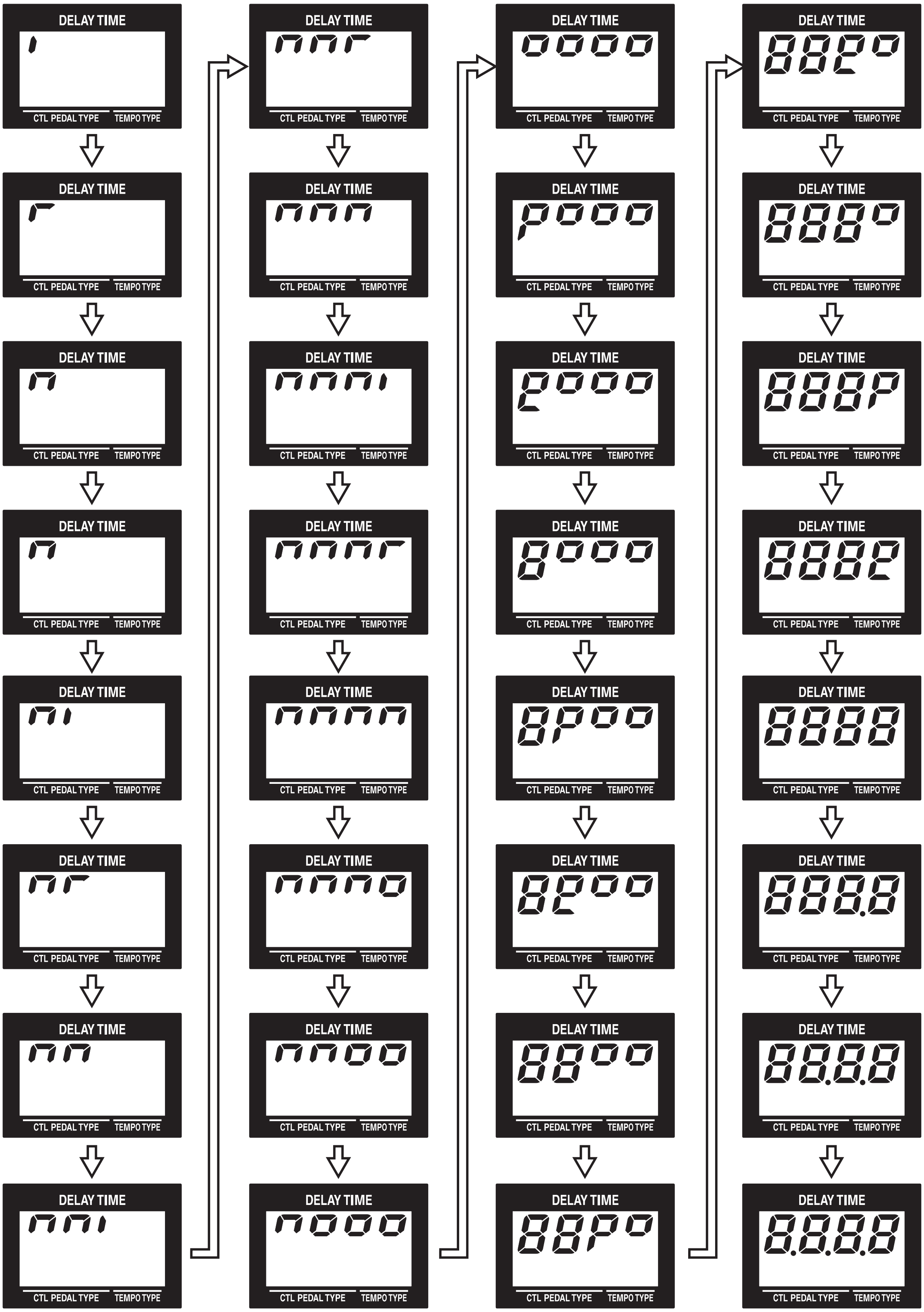
MEMORY, TAP flashing:DSP ERAM error

ON/OFF, MEMORY flashing:DSP INT error

ON/OFF, TAP flashing:DSP DRQ error

2. LCD, Switch, LED Checks, Foot Switch Operational Check

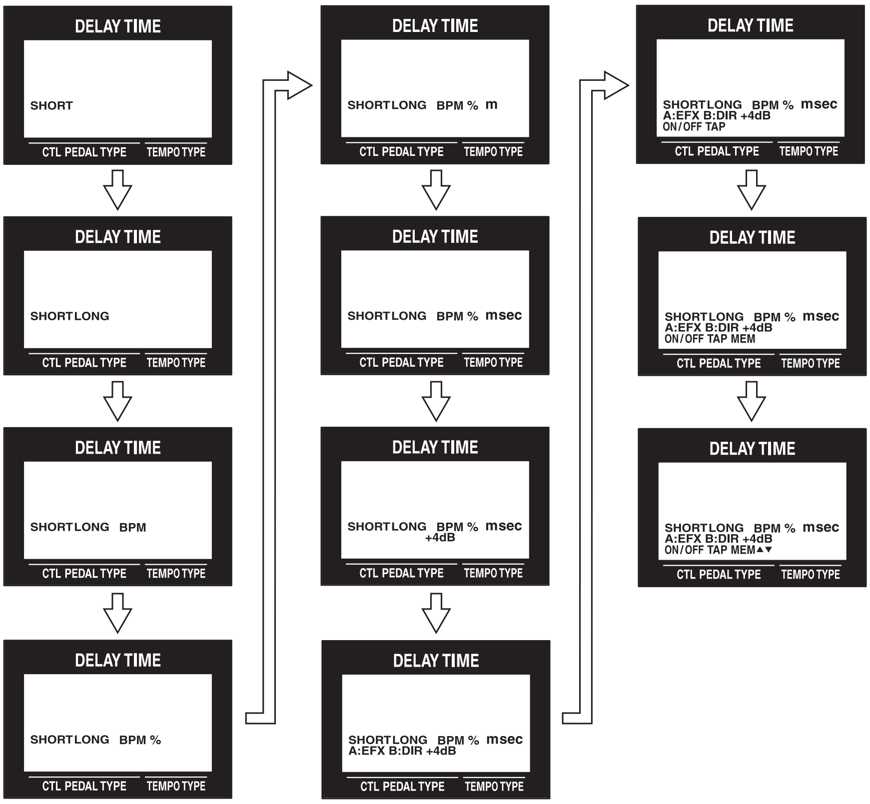
Press the [TAP] switch. Confirm that the LCD’s “8.8.8.8” lights up and go off in the sequence shown below.



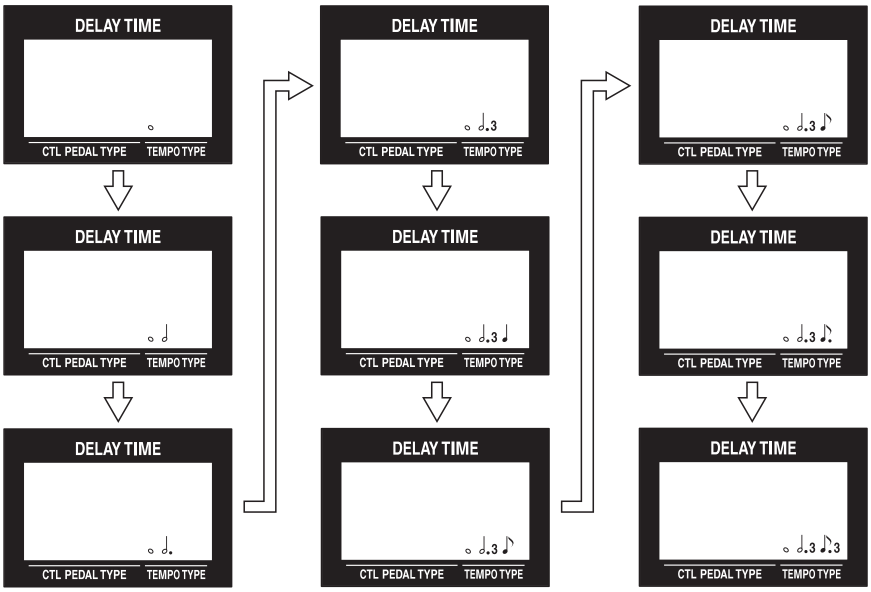
NOTE

If the LCD display does not change even after the [TAP] switch is pressed, confirm that all of the cables are connected to the jacks and the FS-5U “POLARITY” switches are set correctly as described in “1” in “Entering Test Mode.”

- Press the [TEMPO] switch. Confirm that the characters light up and go off in the sequence shown below.



- Press the [WRITE] switch. Confirm that the notes light up and go off in the sequence shown below.



- Press the [SELECT] switch. Confirm that the entire LCD is on and that all of the LEDs are lit.
- Confirm that the LEDs go off in the following sequence, one each time the [SELECT] switch is pressed: “LCD backlighting” “4,” “3,” “2,” “1,” “MANUAL,” “TEMPO,” “MEMORY,” “TAP,” and “ON/OFF.” When “ON/OFF” goes off (all LEDs all unlit), press the [SELECT] switch to turn on all of the LEDs again.
- Press the FS-5U connected to the left channel of the stereo/monaural converter cable (PCS-31 or similar). Confirm that “C 1” appears in the display.
- Press the FS-5U connected to the tight channel of the stereo/monaural converter cable (PCS-31 or similar). Confirm that “C 12” appears in the display.

NOTE

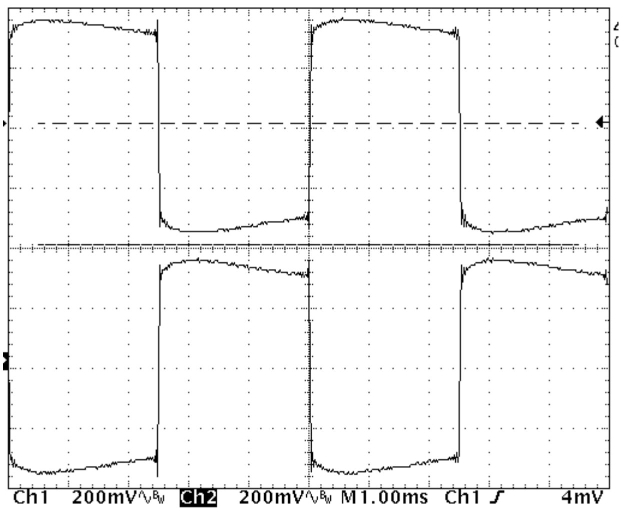
Nothing will appear in the display if the right channel's FS-5U is pressed before the one connected to the left channel.

3. VR, Encoder Check

- Set the MODE control to "TWIST." "2" appears in the LCD.
- Input a sine wave (200 Hz, 16Vp-p) from the oscillator to INPUT A(MONO) and B.
- Connect the oscilloscope to OUTPUT A(MONO) and B.
- Rotate the E.LEVEL volume from the far left (minimum) to far right (maximum). Confirm that the LCD changes from "O" to "127" and that the waveform output from OUTPUT A(MONO) and B changes from minimum to maximum size.
- Rotate the F.BACK volume from the far left (minimum) to far right (maximum). Confirm that the LCD changes from "O" to "127" and that the waveform output from OUTPUT A(MONO) and B changes from minimum to maximum size.
- Rotate the TONE volume from the far left (minimum) to far right (maximum). Confirm that the LCD changes from "O" to "127" and that the waveform output from OUTPUT A(MONO) and B changes from minimum to maximum size.
- Rotate ENC at least two clicks from the far right position. Confirm that "E-" appears in the LCD.
- Rotate ENC at least two clicks from the far left position. Confirm that "E--" appears in the LCD.
- Press the ENC switch. Confirm that "E-O-" appears in the LCD.

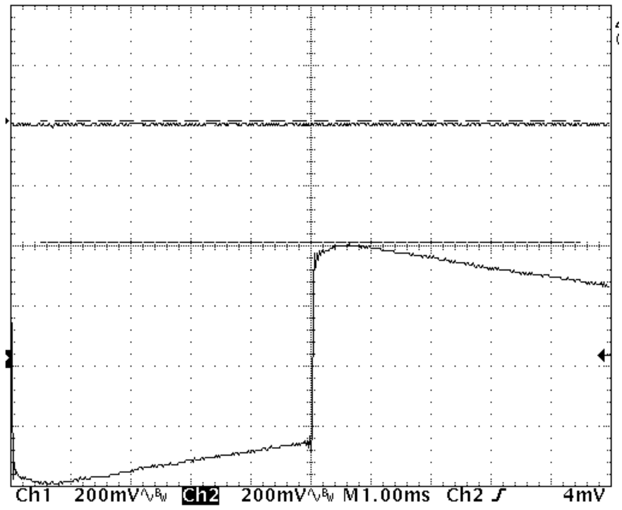
4. DAC, PHONES Check (includes OUTPUT A (MONO), B jack detection check)

- Set the MODE control to "WARP." "3" appears in the LCD.
- Connect the oscilloscope to OUTPUT A(MONO) and B.
- Confirm that the waveform output from OUTPUT A(MONO) and B matches the figure below.



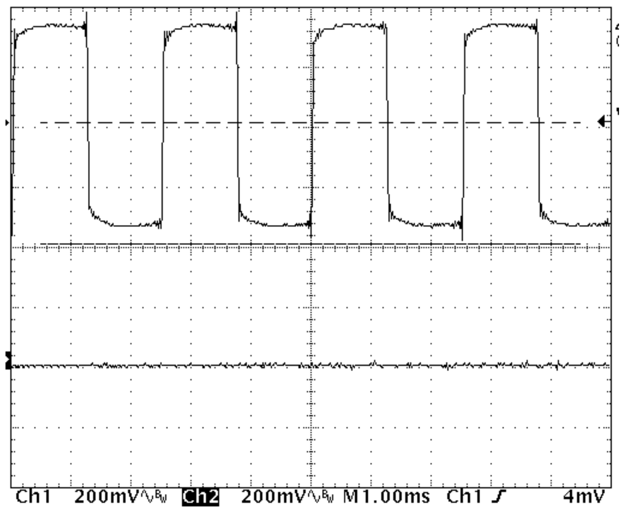
(200 mV/DIV, 1 mS/DIV)

- Disconnect the cable from the OUTPUT A(MONO) jack, leaving the oscilloscope connected only to OUTPUT B.
- Confirm that the waveform output from OUTPUT B matches the figure below.



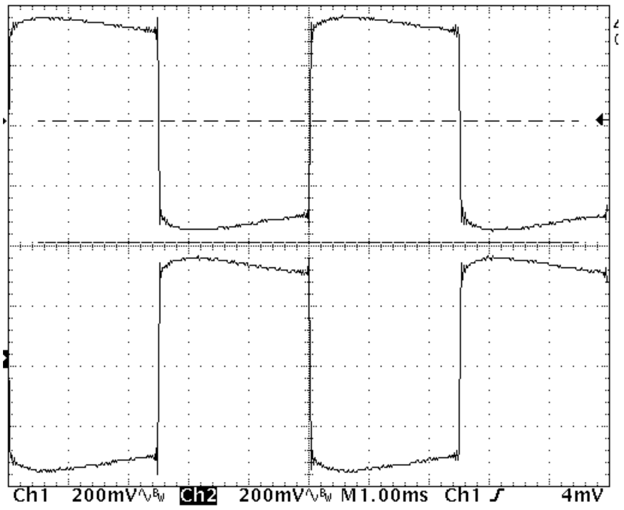
(200 mV/DIV, 1 mS/DIV)

- Connect the oscilloscope to OUTPUT A(MONO), and disconnect the cable from the OUTPUT B jack.
- Confirm that the waveform output from OUTPUT A matches the figure below.



(200 mV/DIV, 1 mS/DIV)

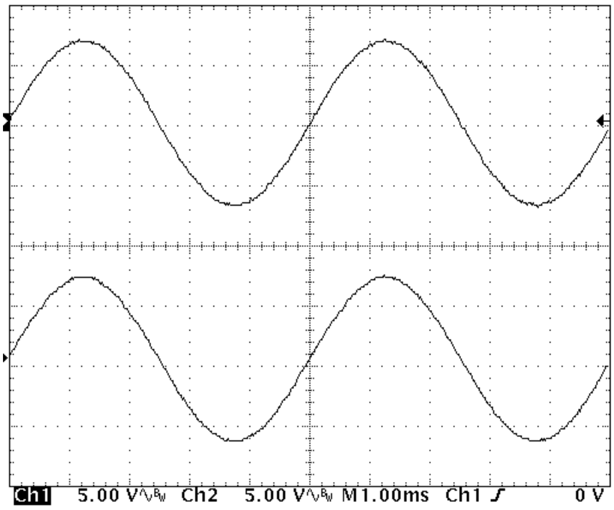
- Connect the cables to the OUTPUT A(MONO) and B jacks.
- Connect the oscilloscope to PHONES L/R.
- Confirm that the waveform output from PHONES L/R matches the figure below.



(200 mV/DIV, 1 mS/DIV)

5. ANALOG BYPASS Check (includes INPUT B jack detection check)

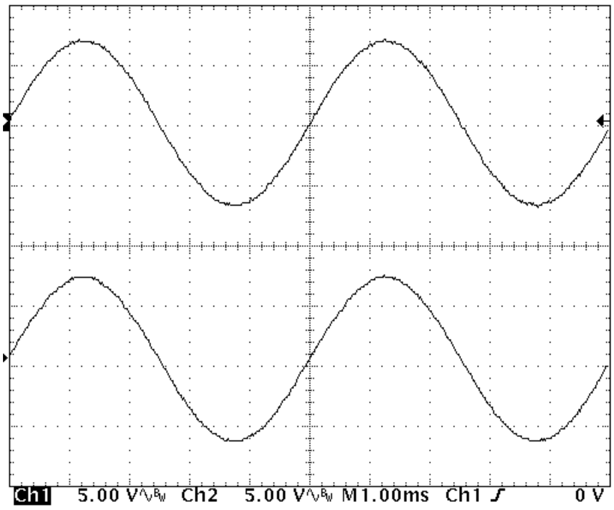
- Set the MODE control to “TAPE.” “4” appears in the LCD.
- Input a sine wave (200 Hz, 16Vp-p) from the oscillator to INPUT A(MONO) and B.
- Connect the oscilloscope to OUTPUT A(MONO) and B.
- Confirm that the waveform output from OUTPUT A(MONO) and B matches the figure below.



(5V/DIV, 1 mS/DIV)

Disconnect the cable from the OUTPUT B jack.

- Confirm that the waveform output from OUTPUT A(MONO) and B matches the figure below.



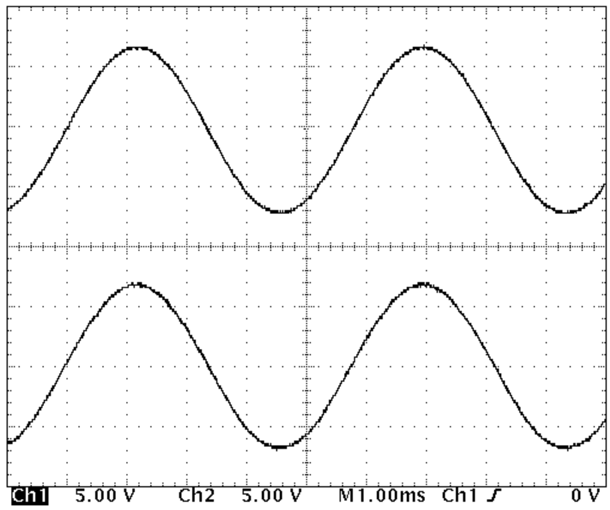
(5V/DIV, 1 mS/DIV)

6. MUTE Check

- Set the MODE control to “ANALOG.” “5” appears in the LCD.
- Input a sine wave (200 Hz, 16Vp-p) from the oscillator to INPUT A(MONO) and B.
- Connect the oscilloscope to OUTPUT A(MONO) and B.
- Confirm that nothing is output from OUTPUT A(MONO) and B.

7. DSP THRU Check

- Set the MODE control to “STANDARD.” “6” appears in the LCD.
- Input a sine wave (200 Hz, 16Vp-p) from the oscillator to INPUT A(MONO) and B.
- Connect the oscilloscope to OUTPUT A(MONO) and B.
- Confirm that the waveform output from OUTPUT A(MONO) and B matches the figure below.



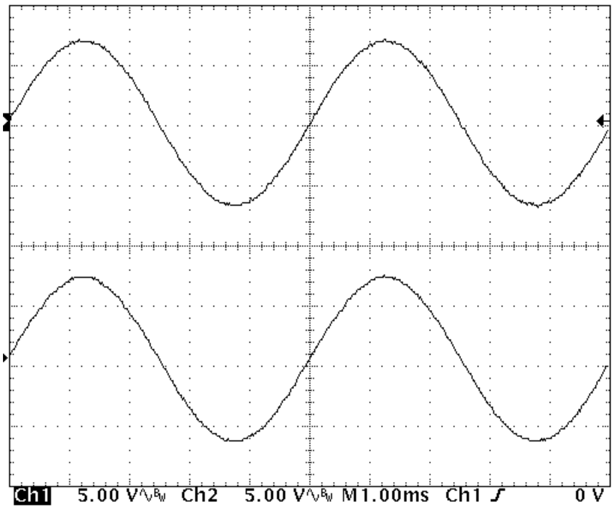
(5 V/DIV, 1 mS/DIV)

8. AD MUTE Check

- Set the MODE control to “DUAL.” “7” appears in the LCD.
- Input a sine wave (200 Hz, 16Vp-p) from the oscillator to INPUT A(MONO) and B.
- Confirm that nothing is output from OUTPUT A(MONO) and B.

9. ANALOG BYPASS Check

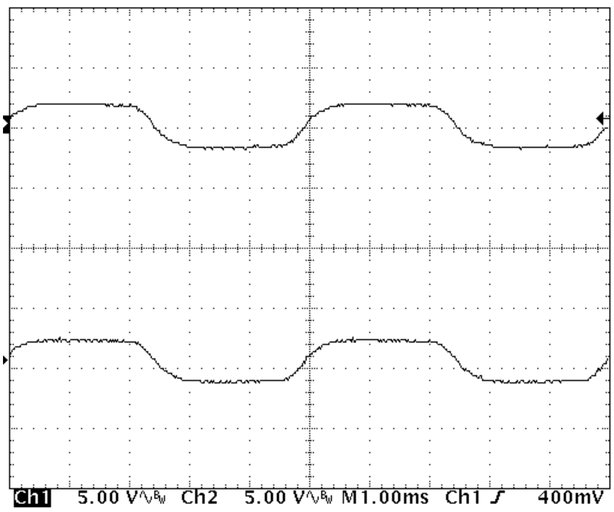
- Set the MODE control to “PAN.” “8” appears in the LCD.
- Input a sine wave (200 Hz, 16Vp-p) from the oscillator to INPUT A(MONO) and B.
- Confirm that the waveform output from OUTPUT A(MONO) and B matches the figure below.



(5 V/DIV, 1 mS/DIV)

10. DSP MUTE Check
- Set the MODE control to “SMOOTH.” “9” appears in the LCD.
- Input a sine wave (200 Hz, 16Vp-p) from the oscillator to INPUT A(MONO) and B.
- Confirm that nothing is output from OUTPUT A(MONO) and B.

11. INPUT Level Switch Check
- Set the MODE control to “MODULATE.” “10” appears in the LCD.
- Input a sine wave (200 Hz, 16Vp-p) from the oscillator to INPUT A(MONO) and B.
- Confirm that the waveform output from OUTPUT A(MONO) and B is distorted as in the figure below.



(5 V/DIV, 1 mS/DIV)

12. SDRAM Check
- Set the MODE control to “REVERSE.” If no problem is detected, “Sd 0” appears in the LCD.

If a problem is detected, the cause is indicated by the LEDs as shown below.
ON/OFF, MEMORY, TAP LEDs flashing: SDRAM error

13. MODE Volume Operational Check
- Following the “SDRAM Check,” rotate the knob one click at a time in the left (counterclockwise) direction.
- Confirm that the numbers appearing in the LCD change one by one with each click from “10” to “1.”

14. Factory Reset

NOTE

Executing Factory Reset results in the loss of all data saved by the user. If Factory Reset is not required, turn off the power to quit Test mode.

NOTE

Factory Reset may be run without entering Test mode. To run Factory Reset only, refer to “Instructions for Running Factory Reset” in these service notes.
- Following the “MODE Volume Operational Check,” rotate MODE from “SOS” to “STANDARD.”
- ”FAct” appears in the LCD, and the “1,” “2,” “3,” and “4” LEDs flash.
- Press the [WRITE] button. The “1,” “2,” “3,” and “4” LEDs flash more rapidly, then return to normal condition.

15. Residual Noise, Shock Noise Check

NOTE

Conduct the “Residual Noise, Shock Noise Check” with the noise meter set to IHF-A, AVERAGE.
- Switch to Test mode according to the instructions in “Entering Test mode.”
- Connect a 47-kΩ short plug to INPUT A(MONO) and B.
- Connect the noise meter to OUTPUT A(MONO). Connect an open plug to OUTPUT B.
- Confirm that the measured value with the noise meter (IHF-A) is -82 dBu or less.
- Connect the noise meter to OUTPUT B. Connect the open plug to OUTPUT A(MONO).
- Confirm that the measured value with the noise meter (IHF-A) is -82 dBu or less.
- Connect a monitor speaker to OUTPUT A(MONO). Connect the open plug to OUTPUT B.
- Subject the unit to shock by dropping it from a height of 10 cm, then confirm that the unit produces no unusual noise.
- Connect a monitor speaker to OUTPUT B. Connect the open plug to OUTPUT A(MONO).
- Shock-test the unit by dropping it from a height of 10 cm, then confirm that the unit produces no unusual noise.
- Connect a monitor speaker to the left side of PHONE L/R.
- Shock-test the unit by dropping it from a height of 10 cm, then confirm that the unit produces no unusual noise.
- Connect a monitor speaker to the right side of PHONE L/R.
- Shock-test the unit by dropping it from a height of 10 cm, then confirm that the unit produces no unusual noise.
- Press the pedal’s ON/OFF switch to return from Test mode to the normal operating mode.
- Adjust the volume as described below.
  E.LEVEL: Maximum (turned completely to the right)
  E.LEVEL: Minimum (turned completely to the left)
  E.LEVEL: Maximum (turned completely to the right)
  MODE: STANDARD

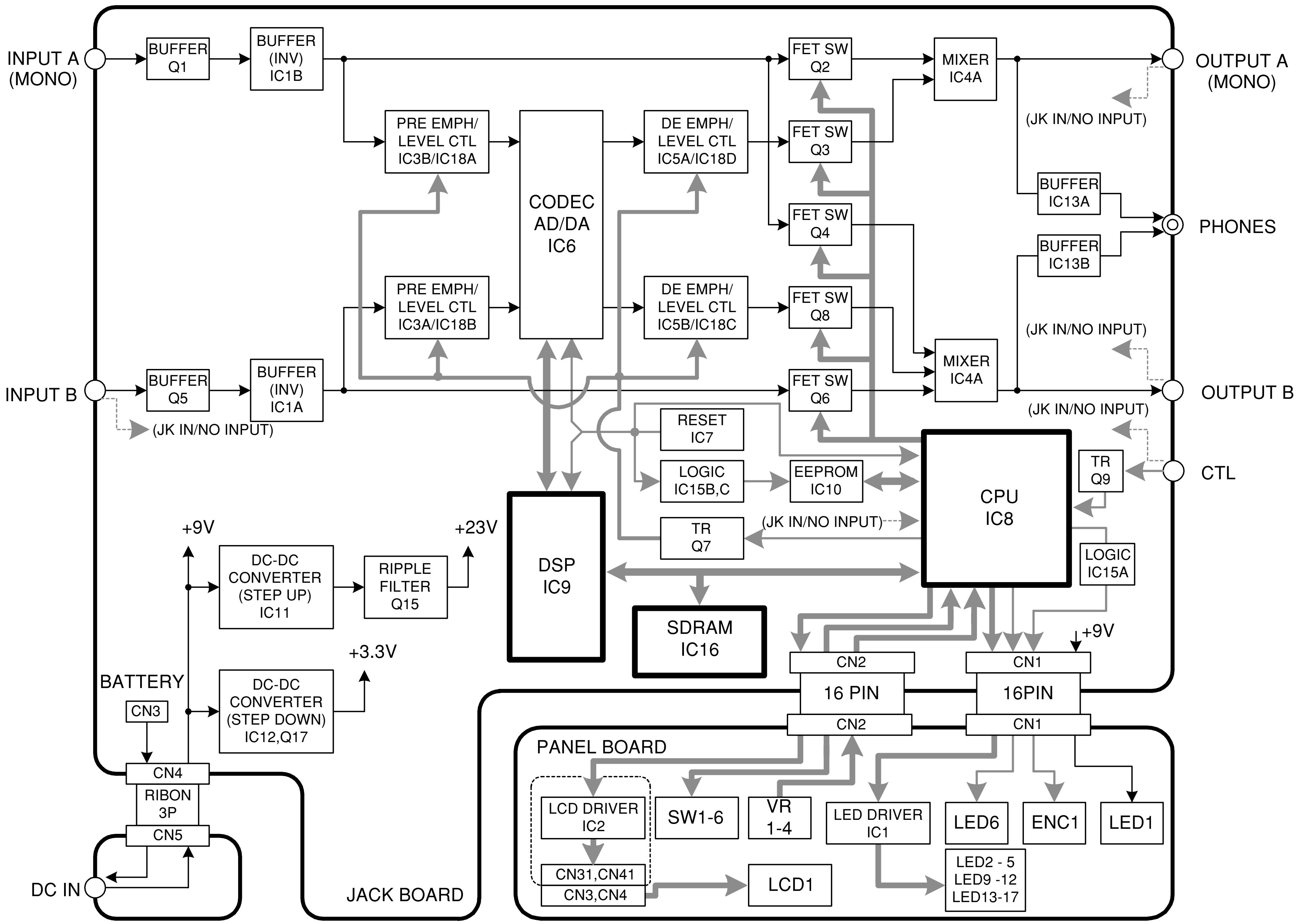
NOTE

If “+4” appears in the LCD, first turn off the power, then use the procedure below to turn the power back on, and perform the following test.
- While holding down the left pedal (ON/OFF), turn on the power.
- Press the [SELECT] switch a number of times until “out1” appears in the LCD.
- Press the [WRITE] switch.
- Connect the noise meter to OUTPUT A(MONO). Connect an open plug to OUTPUT B.
- Confirm that the measured value with the noise meter (IHF-A) is -85 dBu or less.
- Connect the noise meter to OUTPUT B. Connect the open plug to OUTPUT A(MONO).
- Confirm that the measured value with the noise meter (IHF-A) is -85 dBu or less.
- Connect a monitor speaker to OUTPUT A(MONO). Connect the open plug to OUTPUT B.
- Shock-test the unit by dropping it from a height of 10 cm, then confirm

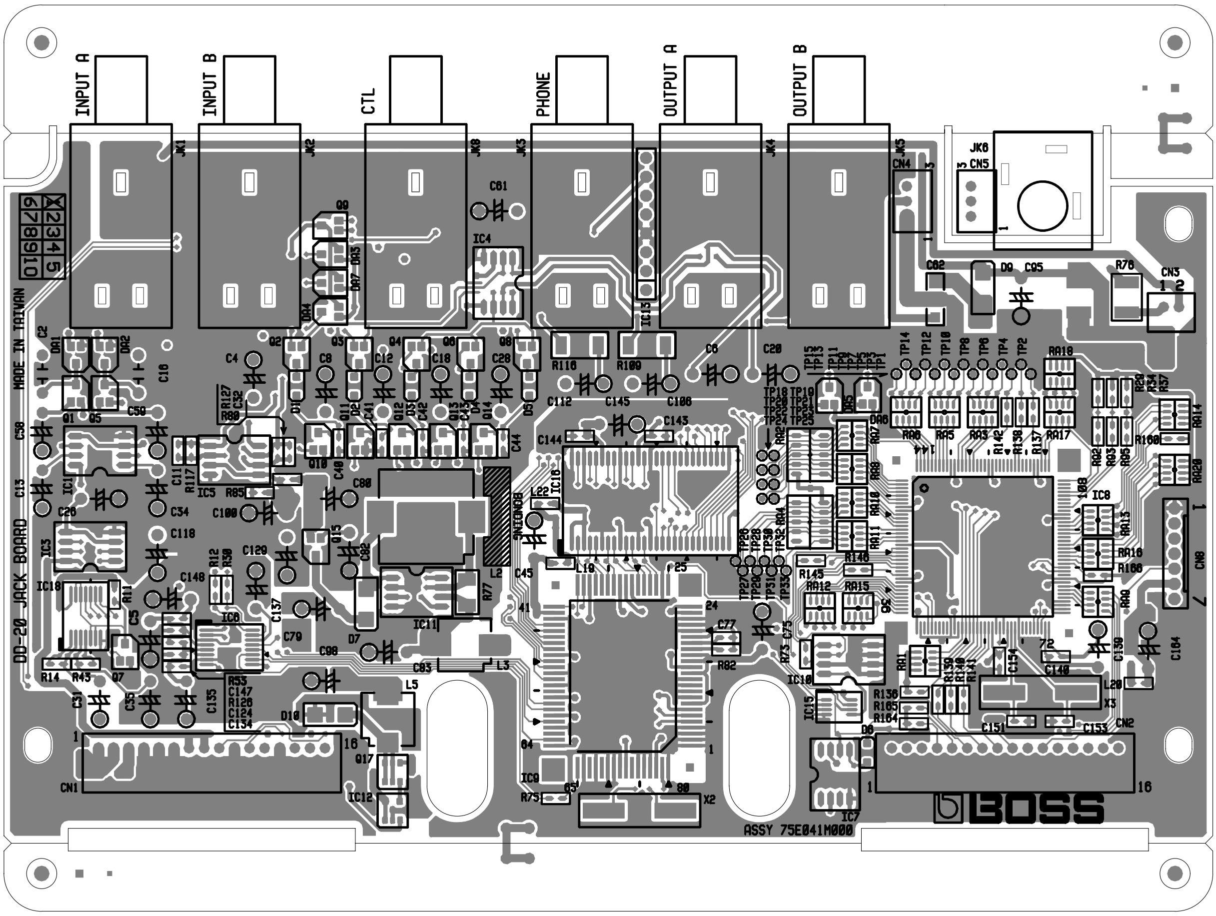
that the unit produces no unusual noise.
- Connect a monitor speaker to OUTPUT B. Connect the open plug to OUTPUT A(MONO).
- Shock-test the unit by dropping it from a height of 10 cm, then confirm that the unit produces no unusual noise.
- Connect a monitor speaker to OUTPUT A(MONO). Connect the open plug to OUTPUT B.
- Shock-test the unit by dropping it from a height of 10 cm, then confirm that the unit produces no unusual noise.
- Rotate F.BACK from the far left (minimum) to far right (maximum) several times, and confirm that there is no scratching or other such noise from the monitor speakers.
- Set F.BACK to the far left (minimum).
- Rotate TONE from the far left (minimum) to far right (maximum) several times, and confirm that there is no scratching or other such noise from the monitor speakers.
- Set TONE to the far right (maximum).
- Rotate E.LEVEL from the far left (minimum) to far right (maximum) several times, and confirm that there is no scratching or other such noise from the monitor speakers.
- Set E.LEVEL to the far right (maximum).
- Rotate MODE from the “SOS” to “REVERSE” several times, and confirm that there is no scratching or other such noise from the monitor speakers.
- Set MODE to “STANDARD.”
- Rotate ENCODER back and forth from left to right several times, and confirm that there is no scratching or other such noise from the monitor speakers.
- Set the volumes as follows.
  E.LEVEL: CENTER
  F.BACK: CENTER
  TONE: CENTER
  MODE: STANDARD
  DELAY TIME: 300ms
- Connect the noise meter to OUTPUT A(MONO). Connect an open plug to OUTPUT B.
- Confirm that the measured value with the noise meter (IHF-A) is -93 dBu or less.
- Connect the noise meter to OUTPUT B. Connect the open plug to OUTPUT A(MONO).
- Confirm that the measured value with the noise meter (IHF-A) is -93 dBu or less.

16. Battery Operation Check
- Insert batteries in the battery box, and plug into INPUT A(MONO).
- Confirm that the unit starts in the normal mode.
- Confirm that effect sounds are output.

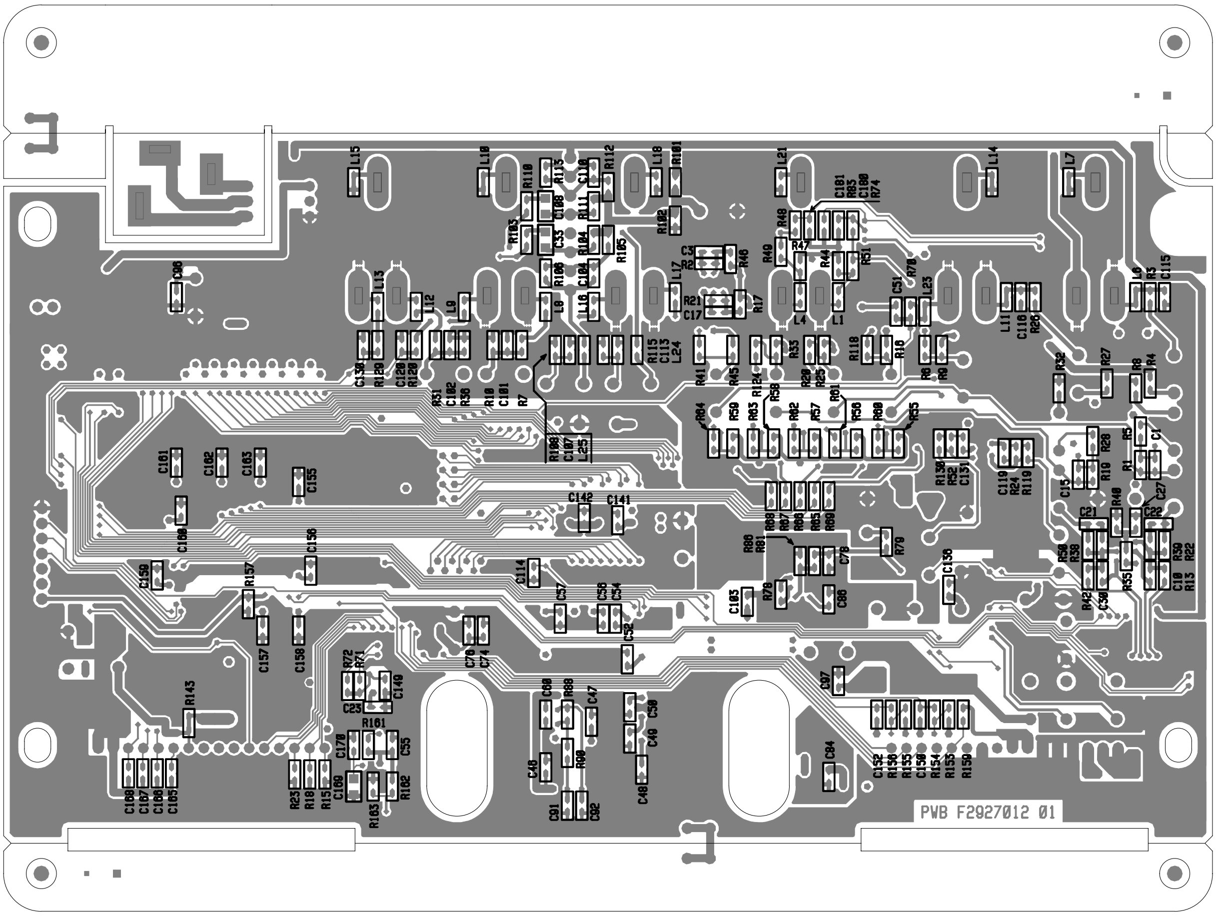
BLOCK DIAGRAM



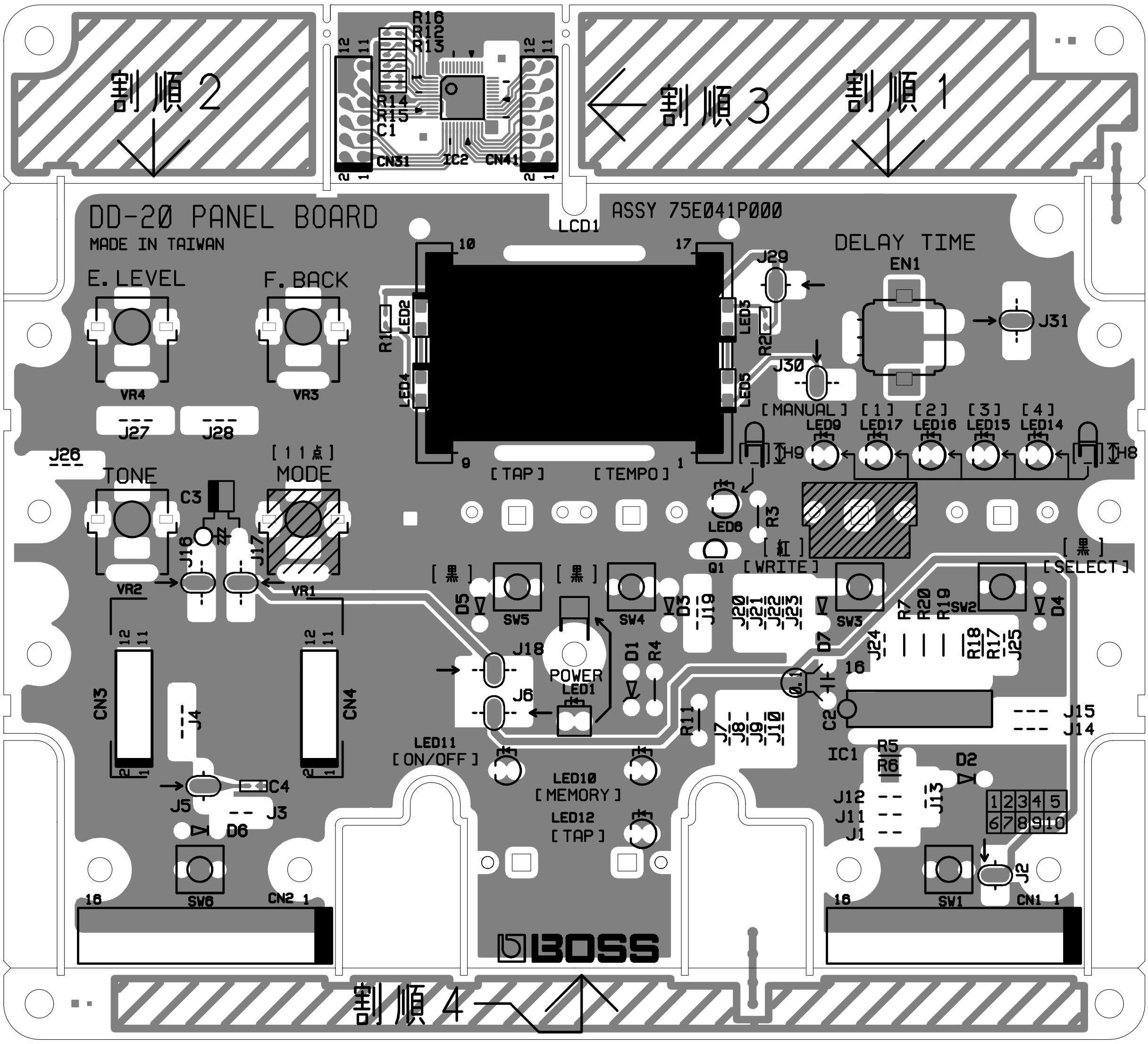
CIRCUIT BOARD (JK-A)



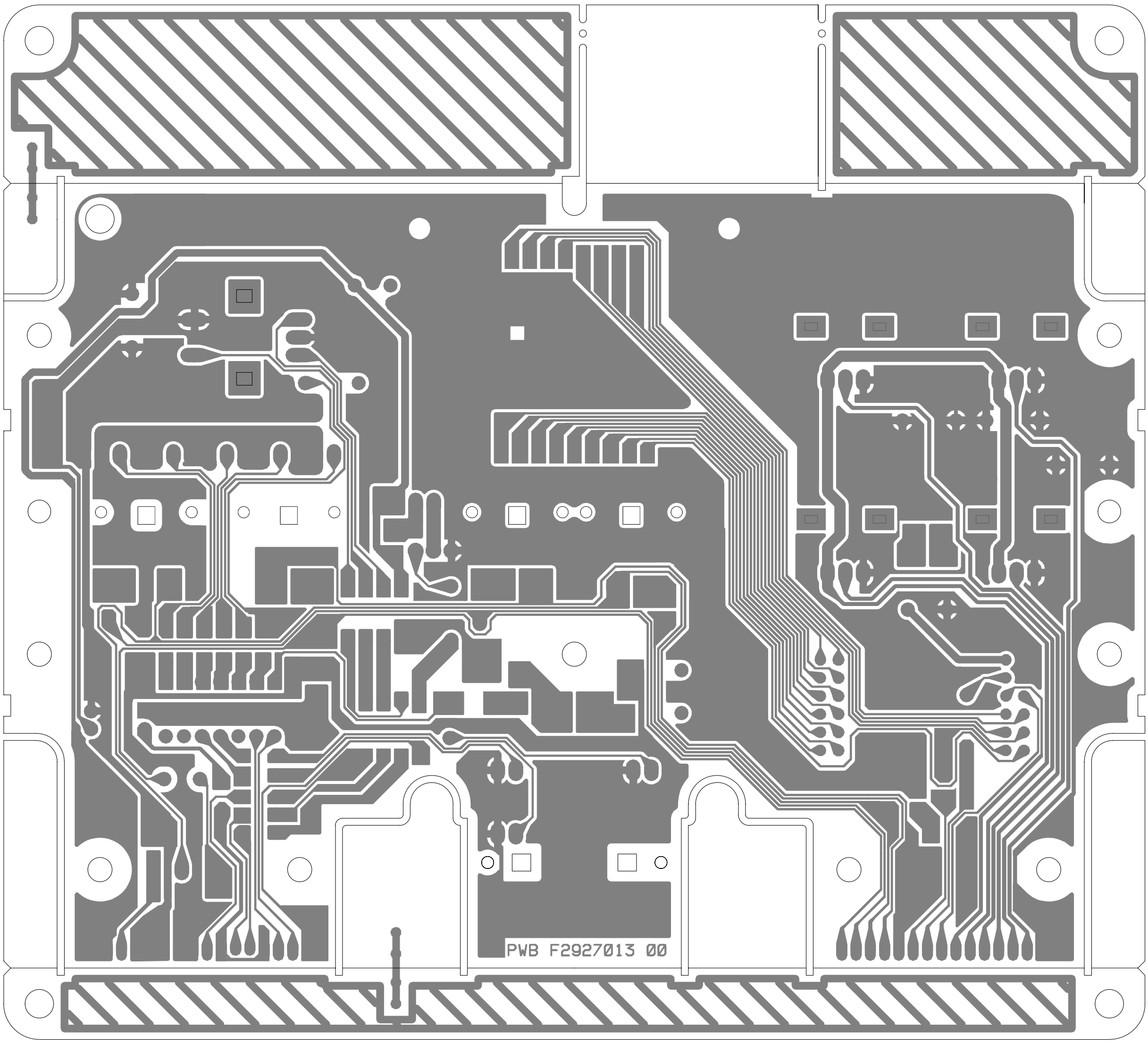
CIRCUIT BOARD (JK-B)



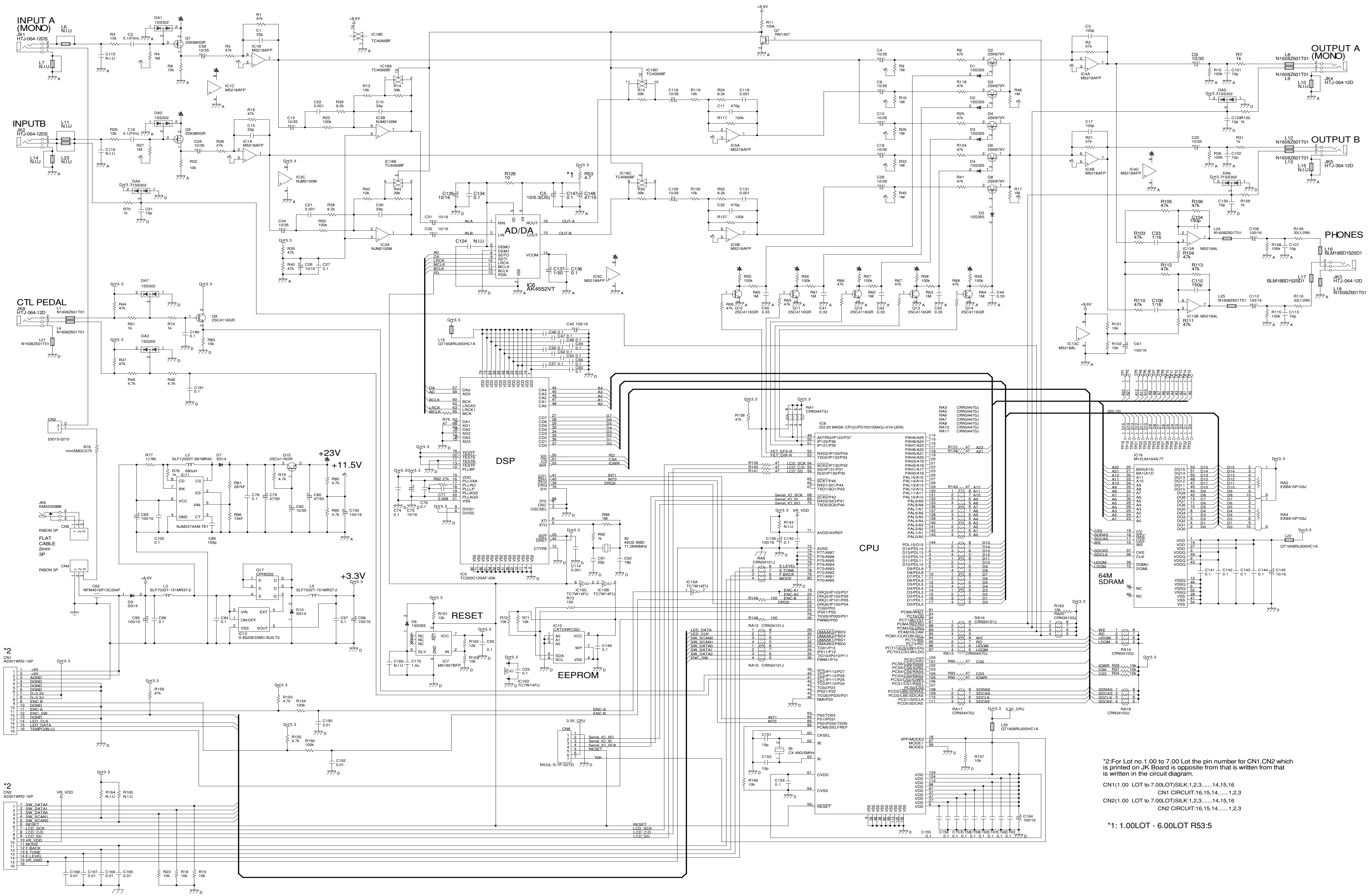
CIRCUIT BOARD (PANEL-A)



CIRCUIT BOARD (PANEL-B)



CIRCUIT DIAGRAM (JACK)



*2:For Lot no.1.00 to 7.00 Lot the pin number for CN1,CN2 which is printed on JK Board is opposite from that is written from that is written in the circuit diagram.

CN1(1.00 LOT to 7.00LOT)SILK:1,2,3.......14,15,16
CN1 CIRCUIT:16,15,14.......1,2,3

CN2(1.00 LOT to 7.00LOT)SILK:1,2,3.......14,15,16
CN2 CIRCUIT:16,15,14.......1,2,3

*1: 1.00LOT - 6.00LOT R53:5

CIRCUIT DIAGRAM(PANEL)

